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EXAMINER

KAO, CHIH CHENG G

ART UNIT PAPER NUMBER

2882

DATE MAILED: 05/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/065,683

Applicant(s)

KEVILLE ET AL.

Examiner

Chih-Cheng Glen Kao

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AW

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-121 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-121 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 November 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 11/8/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

Specification

2. The abstract of the disclosure is objected to because it may not exceed 150 words in length. Correction is required. See MPEP § 608.01(b).

3. The disclosure is objected to because of the following informalities, which appear to be minor draft errors. In the following format (location of objection; suggestion for correction), the following suggestions may obviate their respective objections: (Page 21, Paragraph 85, line 5, 'the call'; replacing "call" with - -cell- -) and (Page 22, Paragraph 91, line 1, 'x-ray source means 444'; replacing "444" with - -644- -). Appropriate correction is required.

Drawings

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: (Page 38, Paragraph 148, line 2, '101'), (Page 44, Paragraph 172, line 2, '990'), and (Page 44, Paragraph 172, line 3, '992'). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

5. Claims 16, 18, 19, 22, 23, 28, 34, 37-40, 42, 45, 47-49, 54, 58, 59, 76, 78, 79, 82, 83, 88, 94, 97-99, 102, 105-109, 113, 114, 118, and 119 are objected to because of the following informalities, which appear to be minor draft errors including grammatical and lack of antecedent basis problems.

In the following format (location of objection; suggestion for correction), the following suggestions may obviate their respective objections: (claim 16, line 2, 'the material group'; replacing 'the' with - a- -), (claim 18, line 3, ' $1/\mu * \rho$ '; replacing ' $1/\mu * \rho$ ' with - $1/(\mu * \rho)$ - -), (claim 19, line 2, 'an upper electrode'; replacing 'an upper' with - a lower- -), (claim 19, line 3, ' $1/\mu * \rho$ '; replacing ' $1/\mu * \rho$ ' with - $1/(\mu * \rho)$ - -), (claim 22, line 1, 'The system of claim 2'; inserting - 22. - - at the beginning of the claim), (claim 22, lines 2-3, 'a interelectrode gap range'; replacing 'a' with - an- -), (claim 23, line 3, 'the minimum gap'; replacing 'the' with - a- -), (claim 23, line 5, 'the maximum gap'; replacing 'the' with - a- -), (claim 23, line 6, '5 mm and 10 mm'; inserting a comma after '5 mm'), (claim 28, line 8, 'said pore diameters'; replacing 'said' with - the-

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-, (claim 28, last line, "XRF", replacing "XRF" with - x-ray fluorescence- -), (claim 34, line 2, " $1/\mu\rho$ ", replacing " $1/\mu\rho$ " with - $1/(\mu\rho)$ - -), (claim 37, line 6, "calibration solution containing", inserting a comma after "solution"), (claim 37, lines 6-7, "said fluid of interest", replacing "said" with - a- -), (claim 37, last two lines, "and exposed to x-rays", inserting - when said preconcentration cell is- - after "and"), (claim 38, line 4, "said at least one ion extraction", deleting "said"), (claim 38, line 5, "a second calibration solution", inserting a comma after "solution"), (claim 38, line 8, "detecting and measuring", inserting a comma after "measuring"), (claim 38, line 9, "constant flow rate", inserting a comma after "rate"), (claim 38, line 9, "said voltage", replacing "said" with - a- -), (claim 38, line 10, "said voltage differential", replacing "said" with - a- -), (claim 38, last two lines, "and is exposed to x-rays", inserting - when said preconcentration cell- - after "and"), (claim 39, line 11, "calibration solution", inserting a comma after "solution"), (claim 39, line 13, "and exposed", inserting - when said preconcentration cell is- - after "and"), (claim 39, line 16, "said at least one", deleting "said"), (claim 39, line 17, "calibration solution", inserting a comma after "solution"), (claim 39, line 20, "detecting and measuring", inserting a comma after "measuring"), (claim 39, line 21, "constant flow rate", inserting a comma after "rate"), (claim 39, line 24, "and is exposed", inserting - when said preconcentration cell- - after "and"), (claim 40, line 3, "said at least one", deleting "said"), (claim 40, line 6, "constant flow rate", inserting a comma after "rate"), (claim 40, line 9, "and is exposed", inserting - when said preconcentration cell- - after "and"), (claim 42, line 3, "said at least one", deleting "said"), (claim 42, line 6, "constant rate flow", inserting a comma after "flow"), (claim 42, line 9, "and is exposed", inserting - when said preconcentration cell- - after "and"), (claim 45, line 3, "ceasing flowing", replacing "flowing" with - flow of- -), (claim 47, line 2, "the extraction", replacing "the" with - an- -), (claim 47, line 3, "2% and 1%", inserting a comma after "2%"), (claim

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48, line 7, "below approximately 5%"; inserting a comma before "below"), (claim 48, line 19, "for said concentration C"; inserting - having- - after "for"), (claim 48, line 20, "parts per billion, σ is"; inserting - wherein- - after the comma), (claim 49, line 2, "the extraction percentage"; replacing "the" with - an- -), (claim 49, line 3, "2% and 1%"; inserting a comma after "2%"), (claim 54, line 1, "The system of claim 1"; inserting - 54. - - at the beginning of the claim), (claim 54, line 10, " λ designates a thickness"; replacing " λ " with - l - -), (claim 58, line 3, "said ions"; deleting "said"), (claim 59, line 4, "said x-rays"; deleting "said"), (claim 76, line 3, "the material group"; replacing "the" with - a- -), (claim 78, line 3, " $1/\mu * \rho$ "; replacing " $1/\mu * \rho$ " with - $1/(\mu * \rho)$ - -), (claim 79, line 3, " $1/\mu * \rho$ "; replacing " $1/\mu * \rho$ " with - $1/(\mu * \rho)$ - -), (claim 82, line 3, "a interelectrode gap"; replacing "a" with - an- -), (claim 83, line 4, "the minimum gap"; replacing "the" with - a- -), (claim 83, line 6, "the maximum gap"; replacing "the" with - a- -), (claim 83, line 7, "5 mm and 10 mm"; inserting a comma after "5 mm"), (claim 88, line 8, "said pore diameters"; replacing "said" with - the- -), (claim 88, last line, "XRF"; replacing "XRF" with - x-ray fluorescence- -), (claim 94, line 3, " $1/\mu \rho$ "; replacing " $1/\mu \rho$ " with - $1/(\mu \rho)$ - -), (claim 97, line 5, "said fluid of interest"; replacing "said" with - a- -), (claim 98, line 7, "said second calibration"; replacing "said" with - a- -), (claim 98, line 8, "flowing a second"; replacing "a" with - said- -), (claim 98, line 16, "said at least one"; deleting "said"), (claim 99, line 23, "said second calibration"; replacing "said" with - a - -), (claim 99, line 24, "flowing a second calibration"; replacing "a" with - said- -), (claim 99, line 32, "said at least one"; deleting "said"), (claim 102, line 7, "constant flow rate"; inserting a semi-colon after "rate"), (claim 105, line 2, "ceasing flowing"; replacing "flowing" with - flow of- -), (claim 106, line 2, "cell so a"; replacing "a" with - as- -), (claim 107, line 2, "from the extraction"; replacing "the" with - an- -), (claim 107, line 3, "2% and 1%"; inserting a comma after "2%"), (claim 108, line 20, "for said

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concentration C'; replacing "for" with - -having- -), (claim 108, line 24, "parts per billion, σ is"; inserting - -wherein- - after the comma), (claim 109, line 2, "from the extraction"; replacing "the" with - -an- -), (claim 109, line 3, "2% and 1%"; inserting a comma after "2%"), (claim 113, line 5, "said leakage current monitoring means"; replacing "said leakage current monitoring means" with - -the monitoring of the leakage current- -), (claim 114, line 1, "The method of claim 1"; replacing "1" with - -62- -), (claim 114, line 11, " λ designates a thickness"; replacing " λ " with - - l - -), (claim 118, line 2, "said ions"; deleting "said"), and (claim 119, line 4, "emitting said x-rays"; deleting "said").

For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-61 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: means for obtaining data associated with said cell enabling a concentration of at least one element in said fluid to be deduced.

The recitations in claim 1 essentially recite a system for detecting and measuring concentrations comprising an ionic preconcentration cell and data. However, it is unclear as to how the data is obtained by any structural and functional interrelationship between the data and

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other claimed aspects of the invention, which permit the data functionality to be realized. Means for obtaining data are essential in order to detect and measure concentrations.

7. Claims 17, 26, 27, 77, 86, and 87 respectively contain the trademark/trade names Delrin[®] and Kapton[®]. Where a trademark or trade name is used in a claim as a limitation to identify or describe a particular material or product, the claim does not comply with the requirements of 35 U.S.C. 112, second paragraph. The claim scope is uncertain since the trademark or trade name cannot be used properly to identify any particular material or product. A trademark or trade name is used to identify a source of goods, and not the goods themselves. Thus, a trademark or trade name does not identify or describe the goods associated with the trademark or trade name. In the present case, the trademark/trade name is used to respectively identify/describe a plastic and a window and, accordingly, the identification/description is indefinite.

8. Claims 38 and 98 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements or essential steps, such omission amounting to a gap between the necessary structural connections or steps. See MPEP § 2172.01. The omitted structural cooperative relationships or steps are: a first calibration solution in relationship to a second calibration solution.

Claim 38 recites "a second calibration solution" in line 5. However, the claim, intervening claim, and base claim do not recite a first calibration solution prior to the second calibration solution. It is indefinite as to how one can have a second calibration solution without a first calibration solution. For purposes of examination, the claim has been treated as depending from

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claim 37 instead of claim 2, since a first calibration solution has been recited in claim 37. Also note that this would resolve lack of antecedent basis issues for "said fluid of interest" in line 6 and "said minimum detection level" in line 7 of claim 38.

Claim 98 has analogous recitations and issues. For purposes of examination, the claim has been treated as depending on claim 97 instead of claim 62.

9. Claims 61-121 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted step is: a step for detecting and measuring a concentration of at least one element in said fluid, using data associated with said cell.

The omitted step recited above is essential, since a method for detecting and detecting concentrations needs at least one step for detecting. There is no essential step for detecting to link the step for applying a voltage differential to the step for deducing a concentration.

The Examiner has examined the claims to the best of his understanding as follows.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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10. Claims 1, 2, 4-16, 18-23, 32-35, 44, 50-53, 55-60, 62, 64-76, 78-83, 92-95, 104, 110-113, and 115-120 are rejected under 35 U.S.C. 102(b) as being anticipated by Tran et al. (US Patent 6309532).

11. Regarding claims 1, 2, and 62, Tran et al. discloses system and method (col. 32, lines 45-48 and 54-56) comprising an ionic preconcentration cell (Fig. 24), comprising an upper high surface area electrode (Fig. 24, #524, and col. 30, lines 62-65), a lower high surface area electrode substantially parallel to the upper electrode (Fig. 24, #526, and col. 31, lines 7-9), a central flow interelectrode gap (Fig. 24, #530), fluid flow means for flowing a fluid (Fig. 24, inflow and outflow), voltage application means for applying a voltage differential between the electrodes while the fluid is flowing through the gap (Fig. 24, (+) and (-)), and means for obtaining data (col. 33, lines 3-4) enabling a step for detecting and measuring concentration of at least one element to be deduced (col. 16, lines 23-27).

12. Regarding claims 4, 5, 64, and 65, Tran et al. further discloses upper and lower transmission windows in intimate contact with the electrodes (Fig. 29, #603 and 605).

13. Regarding claims 6, 7, 11, 12, 66, 67, 71, and 72, Tran et al. further discloses inlet and outlet flow means comprising a slot (Fig. 24, inflow and outflow).

14. Regarding claims 8, 13, 68, and 73, Tran et al. further discloses a plurality of flow tubes (Figs. 10 and 27).

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15. Regarding claims 9 and 69, Tran et al. further discloses turbulence enhancement means (Fig. 28, curve around #608).

16. Regarding claims 10, 14, 70, and 74, Tran et al. further discloses debris cleaning means (col. 18, lines 21-30).

17. Regarding claims 15 and 75, Tran et al. further discloses a body comprising a material comprising substantially no conductivity, resistance to ionic leaching, and resistance to radiation degradation (Fig. 27, #546-549).

18. Regarding claims 16 and 76, Tran et al. further discloses a body comprising a material selected from a material group consisting of: plastic, glass, and fiberglass (col. 22, lines 23-24).

19. Regarding claims 18, 19, 34, 78, 79, and 94, Tran et al. further discloses an electrode thickness which would necessarily be less than or equal to $\lambda = 1 / (\mu \rho)$ (col. 13, line 50), since it is within the range.

20. Regarding claims 20, 21, 80, and 81, Tran et al. would necessarily have electrodes having an ordinary surface area approximately equal to an interrogation spot area to which the cell is exposed (col. 33, lines 3-4).

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21. Regarding claims 22, 23, 82, and 83, Tran et al. further discloses a gap width with a minimum gap width selected from a group consisting of 2 mm, 1mm, .5 mm, and .25 mm, and a maximum gap width selected from a group consisting of 2 mm, 5 mm, and 10 mm, which would necessarily be within the range of

$$d = \frac{\sigma \Phi w_i}{q \epsilon w_f n_f C F} \times 100\% \approx 2 \times 10^{-9} \frac{\Phi w_i A}{q \epsilon w_f n_f F} \times 100\% \propto \frac{\Phi A}{\epsilon F},$$

since the gap width is within that range (col. 29, line 7).

22. Regarding claims 32, 33, 92, and 93, Tran et al. further discloses nano-cellular carbon aerogel (col. 9, lines 60-67).

23. Regarding claims 35 and 95, Tran et al. further discloses the electrodes matching thicknesses to approximately $\pm 10\%$ (Fig. 24, #524 and 526).

24. Regarding claims 44, 59, 104, and 119, Tran et al. would necessarily have x-ray source and fluorescence detector means (col. 33, lines 3-4) in order to generate and detect x-rays for x-ray fluorescence analysis.

25. Regarding claims 50 and 110, Tran et al. further discloses a voltage differential below an electrochemical potential of at least one element of interest and below an electrolysis potential of the fluid (col. 19, lines 43-49).

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26. Regarding claims 51, 52, 111, and 112, Tran et al. further discloses leakage current monitoring means or ultra-low trace measuring means for detecting a saturation state (Fig. 5, #145).

27. Regarding claims 53 and 113, Tran et al. further discloses leakage current monitoring (Fig. 5, #145) and time control means (Fig. 5, #128, and col. 14, lines 51-53).

28. Regarding claims 55-57 and 115-117, Tran et al. further discloses triggering means (col. 14, lines 35-44) for injecting at least one element in the fluid or diluting (col. 7, lines 8-15) when the fluid has passed a predetermined threshold concentration (col. 12, lines 5-9).

29. Regarding claims 58 and 118, Tran et al. further discloses ionic release means (col. 15, lines 4-8).

30. Regarding claims 60 and 120, Tran et al. further discloses analysis means for deducing a concentration (col. 14, lines 35-58).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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31. Claims 3, 45, 63, and 105 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al. as respectively applied to claims 2 and 62 above, and further in view of Fajt et al. (US Patent 6045685).

Tran et al. discloses a system and method as recited above.

However, Tran et al. does not disclose a transportable voltage supply.

Fajt et al. teaches a transportable voltage supply (col. 13, lines 29-32).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the system and method of Tran et al. with the voltage supply of Fajt et al., since one would be motivated to incorporate a transportable voltage supply for low costs and high portability (col. 13, lines 29-37) as implied from Fajt et al.

32. Claims 61 and 121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tran et al. as respectively applied to claims 1 and 62 above, and further in view of Moulthrop, Jr. et al. (US Patent Application Publication 2002/0051898).

Tran et al. discloses a system and method as recited above.

However, Tran et al. does not disclose a telecommunications link.

Moulthrop, Jr. et al. teaches a telecommunications link (Paragraph 50).

It would have been obvious, to one having ordinary skill in the art at the time the invention was made, to modify the system and method of Tran et al. with the telecommunications link of Moulthrop, Jr. et al., since one would be motivated to incorporate this to better centralize or distribute the control system (Paragraph 50) as implied from Moulthrop, Jr. et al.

Allowable Subject Matter

33. Claims 24, 25, 28-31, 36-43, 46-49, 54, 84, 85, 88-91, 96-103, 106-109, and 114 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base, intervening claims, and base claim.

34. The following is a statement of reasons for the indication of allowable subject matter:

Regarding claims 24 and 84, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including an upper transmission window comprising x-ray transparency greater than 90% for characteristic photon energies from an element of interest for which a fluidic concentration is to be measured and x-ray scattering therefrom minimized to less than approximately 10% of radiation scattered from a column of fluid equal to one optical depth in the fluid of a characteristic photonic energy from an element of interest for which a fluidic concentration is to be measured, in combination with all the limitations in each respective claim, intervening claim, and base claim.

Regarding claims 25 and 85, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including a lower transmission window comprising x-ray transparency greater than 90% for characteristic photon energies from an element of interest for which a fluidic concentration is to be measured and x-ray scattering therefrom minimized to less than approximately 10% of radiation scattered from a column of fluid equal to one optical depth in the fluid of a characteristic photonic energy from an

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element of interest for which a fluidic concentration is to be measured, in combination with all the limitations in each respective claim, intervening claims, and base claim.

Regarding claims 28 and 88, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including electrode material comprising x-ray transparency greater than approximately 90% for characteristic photon energies from an element of interest for which a fluidic concentration is to be measured and freedom from metallic impurities in excess of approximately .5 parts per million when measured by x-ray fluorescence, in combination with all the limitations in each respective claim and base claim. Claims 29-31 and 89-91 contain allowable subject matter by virtue of their dependency.

Regarding claims 36, 39, 96, and 99, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including background data from at least one background data energy channel of a preconcentration cell when the cell is filled with a highly purified form of a fluid of interest and exposed to x-rays, in combination with all the limitations in each respective claim, intervening claim, and base claim. Claims 42, 43, 102, and 103 contain allowable subject matter by virtue of their dependency.

Regarding claims 37 and 97, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including sensitivity data from at least one sensitivity data energy channel of a preconcentration cell when the cell is filled with a first calibration solution containing at least one element of interest in a fluid of interest in known concentration above a minimum detection level of x-ray detection equipment, in combination with all the limitations in each respective claim and base claim. Claims 38 and 98 contain allowable subject matter by virtue of their dependency.

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Regarding claims 40 and 100, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including test data accumulation means for obtaining test data comprising data related to a rate at which photons are detected when fluid flows at a substantially constant rate, while a voltage application means applies a voltage differential below an electrochemical potential of at least one element of interest and below an electrolysis potential of the fluid, in combination with all the limitations in each respective claim, intervening claim, and base claim. Claims 41 and 101 contain allowable subject matter by virtue of their dependency.

Regarding claims 46, 48, 106, and 108, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including flow control means to maintain ε below approximately 5% for at least one element of interest, in combination with all the limitations in each respective claim, intervening claim, and base claim. Claims 47, 49, 107, and 109 contain allowable subject matter by virtue of their dependency.

Regarding claims 54 and 114, prior art does not disclose or fairly suggest a system and method for detecting and measuring concentrations of elements in fluids including time control means for flowing fluid for a time t given by

$$t \propto \frac{SI}{\sigma} \propto \frac{SI}{C},$$

in combination with all the limitations in each respective claim and base claim.

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Conclusion

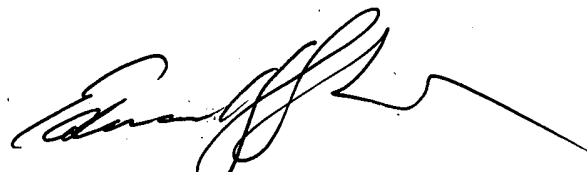
35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patents 4388530, 5349624, and 6012325, along with Japanese Published Patent Application 01-214748, disclose various systems for detecting and measuring using x-rays. US Patent 5503004 discloses a system for detecting and measuring.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571) 272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


gk


EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER